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SCHOOL ENVIRONMENT, GUIDE, LAW AND REGULATIONS.

MONTANA STATE BOARD OF HEALTH, HELENA

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THIS REPORT CONSISTS OF THREE PARTS--(1) GUIDE, (2) LAWS, AND (3) REGULATIONS FOR PROVIDING A HEALTHFUL SCHOOL ENVIRONMENT IN MONTANA. INFORMATION INCLUDED WILL ASSIST IN THE PROPER DESIGN AND CONSTRUCTION OF NEW AND REMODELED SCHOOL BUILDINGS AND IN THE OPERATION AND MAINTENANCE OF A HEALTHFUL ENVIRONMENT FOR SCHOOL CHILDREN AND PERSONNEL. PART ONE DESCRIBES WHAT IS DESIRABLE AND THE REASONS FOR CERTAIN FEATURES IN THE SCHOOL ENVIRONMENT. IT DEALS WITH THE SANITARY MAINTENANCE OF SCHOOLS. TOPICS DISCUSSED ARE--(1) SITE AND GROUNDS, (2) SCHOOL BUILDINGS, (3) HEATING AND VENTILATION, (4) LIGHTING, (5) WATER SUPPLY AND DISPENSING, AND (6) TOILETS, PLUMBING, AND WASTE DISPOSAL. PART TWO DISCUSSES THE MONTANA STATE LAWS IN TERMS OF--(1) SELECTION, (2) REQUIREMENTS OF ARCHITECTURE APPROVAL BY STATE BOARD OF HEALTH, (3) FLOOR SPACE-AIR-LIGHT-REGULATION BY BOARD OF HEALTH, (4) PENALTIES, (5) SUGGESTIVE PLANS, (6) VESTIBULES, (7) CARE OF SCHOOL HOUSES, AND (8) WATER SUPPLIES AND TOILET ACCOMMODATIONS. PART THREE CONCERNS ITSELF WITH REGULATION AND DISCUSSES--(1) GENERAL REQUIREMENTS, (2) SITE AND GROUNDS, (3) SCHOOL BUILDINGS, (4) LIGHTING, (5) HEATING AND VENTILATING, (6) WATER SUPPLY AND DISPENSING, (7) TOILETS, PLUMBING, AND WASTE DISPOSAL, AND (8) EQUIPMENT. ALL SCHOOL BUILDINGS TO BE ERECTED, REPAIRED, OR ENLARGED IN MONTANA MUST CONFORM TO THE REQUIREMENTS CONTAINED IN THIS PART. CHARTS, DIAGRAMS,AND PHOTOGRAPHS ARE INCLUDED. (RK)

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SCHOOL ENVIRONMENT

Guide, Law & Regulations

Relating to Operation *Maintenance*, Building Plans and Construction, and Remodeling for Montana Schools.

1963

Montana
State Board of Health

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FOREWORD

This publication consists of three parts: (1) Guide; (2) Laws and (3) Regulations. Its purpose is to assist those who provide a healthful school environment for Montana's children in school.

In 1913 the Montana Legislature passed the law requiring the State Board of Health to perform certain duties in this respect. This law is included in the second part of this Guide.

To supplement the law the State Board of Health under its legal powers and responsibilities adopts regulations. The regulations are known as Board of Health Regulation No. 91. These have been and will continue to be revised from time to time as new standards, equipment and scientific information become available.

The most recent revision of these regulations, adopted on February 23, 1963 by the State Board of Health is included in this publication. The information in the regulation is minimum and serves as the minimal acceptable standards for schools in Montana.

The Guide portion of this publication brings out what is desirable and the reasons for certain features in the school environment. The two parts should be used to obtain complete information.

The State Board of Health staff has had assistance from the State Department of Public Instruction staff in the preparation of the Guide. The two departments have worked cooperatively through their Joint Staff Committee.

In addition to this the Advisory Council to the Joint Staff Committee has given encouragement and advice. A subcommittee was appointed by Governor Nutter. This subcommittee consisting of representatives from the architectural, health, school administration and school teaching professions contributed materially to make the information as accurate as possible.

To all who have given assistance, the State Board of Health is most appreciative and it is hoped that this information will assist in the proper design and construction of new and remodeled school buildings and in the operation and maintenance of a healthful environment for Montana school children and personnel.

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Part I

School Environment Guide

INTRODUCTION

This guide has been prepared to supplement Regulation 91 and to assist the school administrator with the sanitary maintenance of his school. The principal factors contained in a clean, wholesome and satisfactory school environment are: adequate, usable, topographically suitable grounds; functional buildings; an adequate and safe water supply with dispensing facilities; safe sewage disposal devices; adequate toilet facilities; every reasonable provision for the practice of personal hygiene; proper ventilation; the maintenance of a healthy school room temperature; comfortable classrooms equipped with adequate natural and artificial lighting; seating facilities adjusted to the postural needs of pupils and provision of a clean food supply. Attractive school surroundings, free from physical hazards, and the maintenance of an effective janitorial service to assure the pupils of the proper esthetic comfort are also important.

Item I

PLANS TO BE SUBMITTED FOR APPROVAL

Public Health Officials should have a part in planning school improvements. They welcome the opportunity to help as they have at their command important sources of advice and knowledge which should prove useful to persons planning school improvements. Further, the State Board of Health is required by law to review the plans and specifications for their sanitary and health implications and to submit a written approval covering the improvements before this work can be begun.

1. **Plans.**
   a. There should be a statement on the plans, or accompanying them, as to the source of the water supply, how it will be delivered to the school building, and all other information necessary for a clear understanding. A statement explaining the system of sewage disposal should be included.
   b. If a public water supply is to be connected to the building, and a public sewage system is available, this statement is sufficient, but the plans should indicate how and where the services will be connected to the building. The water service line and the sewer service shall be in separate trenches with a minimum separation of ten feet.

Item II

SITE AND GROUNDS

A properly chosen site and a well maintained school ground adds greatly to the appearance of the school and tends to promote a safer and

more enjoyable place for attendance and recreation. An ample site is more important in most instances than a centrally located one, particularly for a secondary school.

1. **Area.**

   a. The area should be sufficient to provide adequate space for school facilities and activities. Provisions for satisfactory water supply and sewage disposal, when not provided by municipalities, as well as ample space for playgrounds, parking of vehicles and loading of students, must be considered.

   b. School buses require ample space other than public thoroughfares for safe loading and unloading of pupils. Parking space for other vehicles should be considered, including that for pupils and teachers, for extracurricular events, and for parking at a stadium when necessary. Parking space is dependent upon the site of the school and the extent to which it may be used by the community.

   c. The play area should be of sufficient size to encourage participation in recreation rather than to spectator sports.

2. **Location.**

   a. The school site should provide desirable isolation from noise, dust and traffic hazards. It is desirable that the school be away from arterial highways, commercial and industrial areas. The site should be easily accessible by walks and drives that are properly protected from traffic and other accident hazards. When the school is located on a main public thoroughfare, the buildings should be a minimum of 50 feet inside the property line.

3. **Drainage and Maintenance of Grounds.**

   a. The topography of the site should be such that slopes are moderate for suitable play area, but sufficient to permit good drainage of surface water. Depressions or holes which tend to retain water should be filled or drained.

   b. The soil should be sufficiently porous to maintain a reasonably dry play yard. In some locations, it may be desirable to provide an all weather surface for a portion of the play yard.

   c. The school grounds should be graded and have a suitable surface for the planned activities.

   d. All parts of the school grounds should be inspected regularly. Obstructions and material which may prove dangerous should be removed. The grounds should also be free of garbage, manure and other refuse.

   e. The walks should be of such construction as to be effective when adverse weather conditions prevail. Well constructed walks, immediately surrounding the building, and an all-weather surface on a portion of the play area will aid in keeping the building clean.

4. **Playground Equipment.**

a. Playground equipment should be provided to meet the needs of all age groups represented. The playground equipment should be so located that it can be adequately supervised, yet far enough from the building that the noise from the children at play will not interfere with classes in session. In no instance should children cross streets, driveways or parking areas to reach the playground site.

NEW SCHOOL BUILDING WITH PAVED PLAY AREA

b. Judgment must be exercised in the location of playground equipment so as not to endanger the users of other equipment.

c. Equipment which creates a hazard to those having use of the equipment or those in the immediate vicinity of the equipment, either under supervision or where there is no supervision, should be eliminated.

d. Playground equipment should be so located that there remains ample play area on the school grounds for organized play. A separate play area with suitable equipment should be provided for the very young children.

e. High school athletic fields or recreational areas may be located away from the building.

5. **Fences.**

a. In some instances, fences are necessary to exclude livestock and to prevent children from running into the street from the playground. The type and height of such fence should be determined by good judgment. In no instance should the fence be of such a type as to create an accident hazard for the pupils or motorists.

Item III

SCHOOL BUILDINGS

School buildings, where the children and their instructors spend the majority of their 1,100 school hours a year, should be properly designed, constructed and maintained. Such conditions promote better health and better facilities for learning through providing a desirable environment in which to work. Much can be done to improve existing facilities. An old building may be satisfactorily modernized. Every modernized school building should be maintained so that it is safe, comfortable and healthful for both the pupils and the school staff.

1. **Buildings.**
   a. The interior and exterior of the building should be properly painted.
   b. There should be no evidence of leaks on the walls or ceilings.
   c. Foundations should be free of cracks and openings which may permit rodents and cold air to enter the building.
2. **Stairs.**
   a. All stairways or ramps should be provided with banisters the height of which should not be less than 42 inches from the floor or step nosing. Hand rails should be placed on each side of the stairs.
   b. Corridors should be of ample width for traffic to move in each direction simultaneously without crowding and conform to building codes.
3. **Classrooms.**
   a. Sizes of classrooms are dependent upon the use for which they are intended. The "Regulation for School House Construction" recommends at least 20 square feet per pupil. (With the tendency to lower ceiling heights, more area may be required to comply with that portion of the state law requiring a 200 cubic foot volume per student.)
4. **Acoustical Qualities.**
   a. When a school is being designed, consideration should be given to sound levels throughout the building. The transmission of sound from classrooms, auditorium and gymnasium should be controlled by the use of sound absorbing materials.

Item IV

HEATING AND VENTILATION

Air comfort is dependent upon uniform temperature, a satisfactory relative humidity and gentle air movement. Rooms subject to rapid changes in temperature or drafts are not suitable. Mechanical ventilation will be found to be much more satisfactory than gravity type of ventilation and should be considered wherever feasible.

1. **Humidity.**
   a. The relative humidity affects the comfort in a room. (For a room having a relative humidity of 15%, room temperatures should be 75

degrees F. to attain the same degree of comfort as a temperature of 72 degrees F. at a relative humidity of 40%.) The relative humidity should be maintained at a level to prevent condensation on the walls and windows of all rooms.

2. **Thermometers.**

   a. The thermometers should be placed on the inside wall at a height of 20 to 30 inches above the floor. This thermometer can be independent of thermostat thermometer when there is danger of the students tampering with the thermostat. The thermostat should be so located that the temperature requirements of Section B-1 are complied with.

3. **Fuel and Heating Equipment.**

   a. The type of fuel used is dependent upon the fuels available in the immediate area. The use of the correct fuel is a matter of economics, convenience and safety.

   b. Specific care must be exercised in the storage and handling of certain fuels as well as in the maintenance of the heating equipment. The fire pots and stacks of oil-burning equipment must be cleaned periodically to prevent a buildup of carbon on the jets, or in the stack, which may cause a fire hazard. Oil storage tanks must be so located that they will not endanger the water supply should leaks develop. Regulations by the Montana Industrial Accident Board regarding handling of fuels should be followed.

   c. Stoves or heating plants should not be located near or under exits since such exits could be blocked in the event of a fire involving the heating plant.

Item V

LIGHTING

It is not intended that the school lighting regulations, recommendations, or laws will reject any type of lighting to the exclusion or benefit of any one other particular type. Progress is constantly being made in the lighting industry and what may be a popular method of lighting today may not be the most highly esteemed in the future.

1. **Lighting Concept.**

   a. The concept of classroom lighting has changed from the former criterion of "foot candles" at desk height to the idea of creating a Luminous Environment. The latter places the correct choice of paints on a par with luminaires (lamps) and demands the consideration of brightness distribution in the whole field of view. Ceilings should be white to reflect the maximum amount of light. Walls should be light, attractive pastel shades to reflect light and promote comfort.

2. **Visible Brightness.**

   a. The illumination engineers have evolved the fundamental requirements for ideal lighting which reduces itself to the simple 3:1 rule which follows:

"The visible brightness variations should be no more than 3:1 for any working plane in a visual field, which, in simplified terms, means that the brightest surface in a visual field should be no more than three times as bright as work surface and the work surface should be no more than three times as bright as the darkest surface. Light should come from a large area to minimize shadows. We have reached the era of interior shadowless lighting."

b. If the 3:1 rule is satisfied, glare, shadows and other troublesome factors are eliminated. Ideal visual conditions are produced by providing a luminous ceiling with high reflectances and walls of light tones or values with light floors and furniture of natural light colors.

3. **Good lighting results in:**

a. Adequate illumination on the desk tops, chalkboards, drafting tables, and other places where children work.
b. Color combinations and contrasts that are easy on the eyes, i.e., proper reflectance values.
c. Limiting light sources so that brightness and glare does not affect the eyes.
d. Enough light must be provided on the darkest days for the children to see tasks easily.
e. Lamps must be shielded so that bright light does not shine into eyes.
f. Lighting fixtures must be comfortable on the eyes when viewed from the rear of the room.
g. The room must be free from sharp shadows.
h. The seating must be so arranged that children do not directly face the windows.
i. The windows must be provided with proper shades or blinds to exclude or diffuse bright lights.
j. The walls, ceilings, chalkboards, desk tops and floors should be finished in light colors with dull surfaces that do not cause bright reflections or glare.

4. **The Visual Environment:**

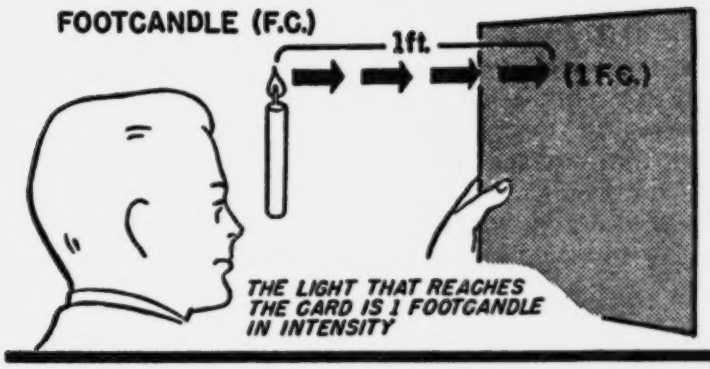
a. Good lighting, in simple terms, is comfortable, glare-free lighting of an amount adequate for the visual task. The illumination levels recommended assume that the lighting on the task is produced by a good lighting system which is comfortable, non-distracting and non-annoying.

b. The illumination levels may be measured by a light meter placed in various parts of the room under various conditions—cloudy days, rainy days, lights on, lights off, etc. Forty foot-candles in one part of the classroom and ten foot-candles in another part cannot give all pupils the consideration they should have. An even distribution of an adequate quantity of light is a basic requirement for good lighting.

c. Satisfactory lighting is not entirely a matter of delivering the recommended levels of lighting where they are needed. Of equal or perhaps even greater importance is the consideration of quality of lighting; confortable seeing conditions for every type of school activity.

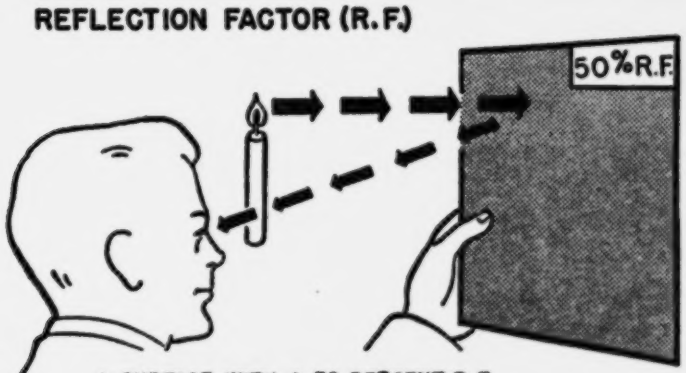
LANGUAGE OF LIGHT

FOOTCANDLE (F.C.)



THE FOOTCANDLE IS A MEASURE OF INTENSITY OF LIGHT

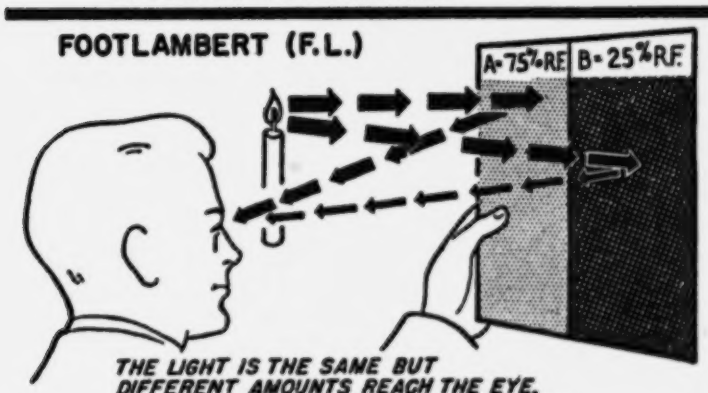
REFLECTION FACTOR (R.F.)



WHITE HAS NEARLY A 100% R.F.

BLACK HAS NEARLY A 0% R.F.

FOOTLAMBERT (F.L.)



THE FOOTLAMBERT IS A MEASURE OF SURFACE BRIGHTNESS. FOOTCANDLES TIMES REFLECTION FACTOR EQUALS FOOTLAMBERTS

BRIGHTNESS DIFFERENCE

From the above sketch:

A = 3/4 of a FOOTLAMBERT
B = 1/4 of a FOOTLAMBERT

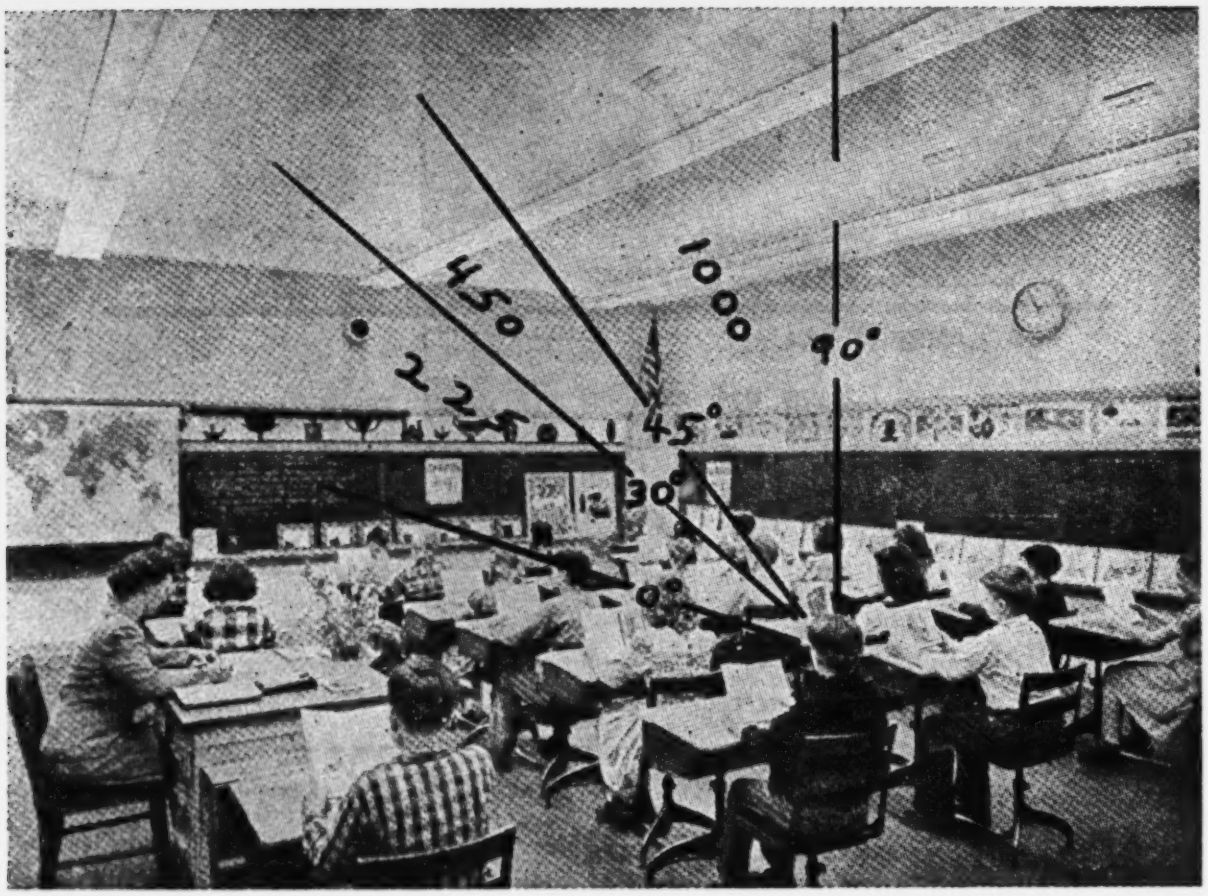
A is to B as 3 is to 1 Brightness difference is 3 to 1

Brightness difference can be measured by comparing footlamberts

AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

d. Visual comfort is attained by: (1) limiting the brightness of the light source, controlling the reflectance values and finishes of the interior of the room, so that brightness ratios in the room are held within reasonable limits.

e. Footlambert is a unit measure of brightness. It is one lumen per square foot emitted or reflected diffusely by a surface. Foot-candles times reflection factor equals footlamberts. (Reflection factor is determined by measuring the light falling upon a surface and the light reflected from that surface. The percent light reflected is the reflection factor.) The brightness of a visual task should not exceed three times the brightness in its immediate surroundings. This is one of the reasons for light colored desks.



MAXIMUM FOOTLAMBERTS RECOMMENDED
To assure visual comfort lighting fixtures should not exceed the limiting brightness given above.

CURRENT RECOMMENDED

LIGHTING LEVELS FOR SCHOOLS

Storerooms	Corridors Laundry Rooms Locker Rooms Shower Rooms Stairways Auditoriums (Not for study)	Cafeterias Reception Rooms Swimming Rooms Gymnasiums (for general exercise)	Classrooms Desks and Chalkboards Study Halls Lecture Rooms Libraries Toilet Rooms Shops	Laboratories Drafting Rooms Typing Rooms Classrooms for pupils with defective vision and those requiring lip reading
5	10	20	30	50

Minimum Maintained Footcandles

f. The ASA American Standard Practice for School Lighting permits doubling the above values if the bright areas of the luminaire are small and the room is finished in accordance with recommended reflectances.

g. To assure visual comfort, lighting fixtures should not exceed the limiting brightness given above.

Reflection factors of 80 percent or better for ceilings, 50 to 60 percent for walls, 35 to 50 percent for desk tops, and 15 to 20 percent for chalkboards—these are the general specifications for practical brightness control in the classroom today.

5. Electric Lighting.

a. Types of Lighting Fixtures—Over the years the cost of electric lighting has constantly declined. With this has come the increased use of light to improve seeing conditions. The high efficiency of the fluorescent lamp has been partially responsible for the recent great strides in school lighting. However, the incandescent lamp is also widely used. Either type is acceptable. The choice between the two is primarily one of economics and satisfactory performance.

If possible and convenient, the electric light banks should be placed parallel to the windows, each bank on a separate switch providing means to supplement the natural light with artificial light for those on the inside of the room and furtherest from the windows when this is desired.

(1) Incandescent.

(a) Indirect incandescent systems produce illumination of excellent quality that is pleasant and free from harsh shadows. It is not widely used for systems supplying more than 40 foot-candles of light because of the excessive generation of heat. The initial cost of incandescent light is low, as compared with fluorescent fixtures.

(2) Fluorescent.

(a) In certain applications the large area of the fluorescent lamp is advantageous from the standpoint of low brightness

and a minimum reflected glare; however, the large area also poses a greater maintenance problem. Fluorescent lighting provides lower electrical cost than incandescent. The operating characteristics of fluorescent lamps must be carefully considered if it is proposed to install them in locations where they will be turned on and off at frequent intervals, or where they will be subjected to excessive fluctuations in supply voltage or to temperature extremes.

(b) In cases where existing wiring capacity limits wattage load, a fluorescent installation is often the only possible solution of the problem of providing higher illumination levels.

b. **Lamps Shielded.**

(1) Whereas various types of fluorescent lighting systems, direct and indirect, are being extensively used for classroom lighting, incandescent lighting is usually of the indirect type. A silvered-bowl concentric ring installation is typical of the latter. Many new schools use this type of lighting because it gives excellent lighting with low initial cost. The same high quality lighting may be obtained at lower operating costs but greater initial cost by using fluorescent luminous indirect equipment.

(2) A compromise between the high quality of indirect lighting, and the efficiency of direct lighting with good maintenance is possible by using the louvered bottom fluorescent fixtures. Better shielded fixtures are being made and many fixtures shield the lamp up to 45° in the direction of the students' view. All fluorescent lamps should be shielded from casual view, for even at half brightness they exceed the maximum limiting values. Unshielded lamps produce distraction, annoyance, and visual discomfort.

c. **Maintenance.**

(1) Poorly maintained lighting systems may deliver half or less of the light for which they were designed and which is being paid for. A reasonable maintenance and cleaning schedule assure at least 70 percent of the initial lighting level.

(2) With silvered-bowl incandescent lighting, the only maintenance required is the replacing of the lamps as they become useless. The concentric ring fixture for silvered-bowl lamps requires a minimum of cleaning. Other open inverted reflectors can be cleaned by blowers or by simply washing or wiping the bowl.

(3) Indirect lighting requires that ceilings be washed or painted as they become dirty, as the light delivered to the room is proportional to the reflectance value of the ceiling.

(4) With fluorescent lighting, more maintenance is needed. The area of the luminaires is greater than that of incandescent equipment. Typical louvered fluorescent fixtures shall be cleaned at least once a year or oftener as it becomes necessary, in order to avoid absorption of light by dust and dirt on the tubes and reflecting surfaces of the fixtures. The frequency of cleaning depends upon the general cleanliness of the classroom atmosphere.

(5) A special cleaning tank is available and is recommended for schools having a large number of fluorescent fixtures. With the use of such a tank and a suitable roller platform to conveniently reach the fixtures, experience has shown that two men can reduce cleaning time in half as compared with a ladder, bucket and sponge operation. The modern household detergents have been found to be quite effective in cleaning fixtures, especially if the cleaning solution can be kept warm. The tank referred to has electric heating units built into it.

6. **Daylighting.**

   a. The amount of daylight in a classroom depends upon the design and location of the windows and varies with the time of day, the type of day and season of the year. In Montana, approximately 45 percent of the days of the year are classified as cloudy or partly cloudy. It is for this reason that electric lighting is mandatory in all school classrooms.

7. **Windows.**

   a. Windows and electrical fixtures shall be so arranged that pupils do not face sources of light.

   b. The amount of glass in a classroom may be reduced to a minimum consisting of a visual strip through which the pupil may look outside. This strip of glass must be at least 16 inches wide and the glass should be at eye level when the pupils are seated. This glass should extend at least two-thirds of the distance of the wall in the wall where the window is located. The pupils should be permitted to have a horizontal view, measured from the outside of the classroom wall, of at least 40 feet.

   c. Special-use rooms as listed in the regulations do not require the installation of outside windows.

   d. If the windows are to be used for ventilation, glass draft deflectors or some other suitable method to prevent drafts must be installed.

8. **Shades.**

   a. The principal problem in bringing daylight into the classroom is the reduction of sun and sky brightness. For example, sunlight streaming into a window is psychologically desirable, but if one tries to read a book in this sunlight the brightness is too great. It is possible for direct sunlight to produce approximately 3,000 foot-candles of light on the students' desks. A printed page reflects about two-thirds of the light falling upon it. A book in this beam of sunlight would have a brightness of 2,000 footlamberts, which is excessive.

   b. A hazy sky seen through a north exposure window may have a brightness greater than 2,000 footlamberts. Assuming an inside wall has a brightness of ten footlamberts, this produces a brightness ratio compared with the inside of the window wall of 200 to 1. This ratio is 20 times that recommended as an upper limit by lighting engineers. It is for these reasons that all classrooms should have shades or some means of reducing the high daylight brightnesses.

c. Roller shades, venetian blinds, prismatic directional type glass blocks, and structural overhang or louvers are means of controlling daylight brightnesses. Shades or blinds should be drawn whenever shafts of direct sunlight are on the students' working surface. They should also be drawn when the outside sky, adjacent light colored buildings, or ground conditions are distractingly high in brightness.

d. Window shades may be translucent and light in color. The double hung roller shades permit the upper part of the window to be left free for delivering light to the far part of the room, while the lower part is shaded to reduce brightness in the students' field of view. Venetian blinds admit more useful light and afford better ventilation than roller shades and are more satisfactory than roller shades from a lighting standpoint. However, venetian blinds must be properly maintained and cleaned.

e. If movies are to be shown in the classroom, opaque shades or draperies are desirable over the windows or the audio-visual type of venetian blind may be permanently installed.

Item VI

WATER SUPPLY AND DISPENSING

Water from improperly constructed or unprotected sources may become contaminated and cause illness. The water may also become contaminated through improper plumbing within the building.

1. **Source.**

Public water supplies should be used as a source of water wherever possible. If a public water supply is not available, construction of water supplies should be in accordance with circulars or bulletins pertaining to the proper construction for water supplies as prepared by the State Board of Health as follows:

"Proper Construction of Dug and Drilled Wells"
"Proper Construction of Springs"
"Proper Construction of Cisterns"

The safety of the water obtained from such properly constructed water supplies should be confirmed by a satisfactory bacteriological analysis made by the State Board of Health Laboratory.

Samples for bacteriological examination should be collected at least annually or more frequently as may be deemed necessary.

There should be no subsurface installation of well pumping machinery with the exception of submersible type pumps. Wells should not be terminated in pits nor should the pumping equipment be installed in pits.

2. **Dispensing.**

All drinking fountains should be so made that the lips of the drinker will not contaminate the metal parts of the orifices of the fountain. Drinking fountains should not be located opposite classroom doors, but should be staggered among the corridor, preferably recessed in the walls.

Item VII

TOILETS, PLUMBING, AND WASTE DISPOSAL

The body wastes of some individuals may contain pathogenic organisms which cause such diseases as typhoid fever, dysentery, hepatitis and other intestinal disturbances. It is therefore imperative that all body wastes be disposed in a manner to prevent the spread of possible disease organisms through direct contact, water pollution, fowls, animals, insects or rodents.

1. **Toilet Rooms.**

   The floors of all toilet rooms should be provided with a properly located drain. Fixtures should be sized to meet the requqirements of the pupils that will use them. Toilet rooms should be of sufficient size to accommodate the required fixtures and the anticipated traffic. A toilet stall with doors requires a space approximately 2½ feet wide, 4½ feet long, with 5 feet of passageway running along the row of stalls. Lavatories or wash fountains should be located near the exits, while urinals should be between the toilets and the wash basins. Mirrors should be located near but not directly over lavatories to prevent crowding at the lavatories. A bookshelf should be provided near the entry for junior and senior high schools or where the pupils move from class to class and carry books with them. Stall-type urinals may be used as a floor drain provided the floor is properly sloped to the urinals, and there are proper trap cleanouts for the urinals.

2. **Privies.**

   Sanitary pit privies should be constructed in accordance with State Board of Health Circular No. 13. Paper towels and waterless soap should be provided in privy units when running water is not available in the school. Boys' privies should have separate openings for urinals to prevent fouling the seat.

3. **Lavatory Facilities and Personal Hygiene.**

   The importance of personal hygiene cannot be over-emphasized. Proper facilities should be available for training the pupils in personal cleanliness, especially the item of keeping hands clean. Children should be taught to wash their hands before eating, after play periods, and immediately after using the toilet.

   a. **Lavatories.**

      (1) Lavatories should be equipped with hot and cold water whenever possible.

      (2) If running water is not available, water may be carried into the schoolroom in buckets and stored in clean covered containers equipped with faucets or spigots for drawing water. A large funnel or collecting basin draining into a waste water container or seepage pit should be placed approximately 8 inches below the faucet. The waste water container should be emptied daily or more often if needed.

(3) Liquid or powdered soap in a suitable dispenser is recommended for school use.

(4) Proper containers should be provided for waste towels.

4. **Garbage and Refuse Disposal.**

a. Wastes such as garbage, trash, and refuse should be disposed of in a sanitary manner. Garbage and non-combustible refuse shall be buried deep enough to prevent flies, animals and rodents from gaining access thereto.

b. Trash and combustible refuse should be burned in an incinerator designed to prevent smoke and fly ash.

c. Garbage and papers, from the school lunch program and from pupils individual lunches, should be kept in covered metal containers until properly disposed by burning or burying as the case may be.

d. When municipal garbage collection is available, the garbage should be stored in covered, fly-tight containers.

Equipment for fire protection, provision for first aid, and maintenance of the building in a clean and sanitary condition is essential for the safety and health of the pupils.

1. **Fire Protection.**

a. All school buildings should keep on each floor one or more fire extinguishers in good working order and with a capacity of not less than two and one-half gallons. In lieu of fire extinguishers, a hose in good condition, one and one-half inches in diameter with nozzle attached and connected to a standpipe with a suitable water supply, may be used. The length of hose should reach all parts of the floor on which it is situated. All fire fighting equipment should be checked annually and extinguishers recharged in accordance with recommendations of the manufacturer.

2. **First Aid.**

For a properly arranged first aid cabinet, you are referred to the "Guide for the Montana School Health Program," published by the State Board of Health.

3. **Chairs and Seats.**

a. Desks and seats should be of the adjustable type.

b. Seats and desks should be easily movable to take advantage of the best light and to simplify floor cleaning.

4. **Coat Rooms.**

There should be adequate wrap storage provided for each classroom.

5. **Maintenance and Cleaning.**

a. Suitable cleaning equipment and an efficient janitorial regimen should be provided for all schools. A recommended cleaning schedule is as follows:

(1) Daily cleaning:

(a) Clean toilet room and fixtures thoroughly with soap and hot water. Check these rooms several times a day for tidiness.

(b) Clean drinking fountains with scouring powder. Check fountains several times each day at noon and recess periods. It may be necessary to clean more often than once each day.

(c) Clean walks as often as necessary to keep them free of snow, ice, and dirt. Sweeping walks outside of entrances prevents tracking dirt inside.

(d) Sweep the entire building after school. Sweep kindergarten rooms once for each half day used. Entrance may require frequent mopping in wet weather.

(e) Empty waste containers each day or more often when necessary.

(f) Dust all classroom furniture. This includes chalk trays and window ledges.

(g) Check grounds for litter and trash.

(h) Blow down boiler, and check heating equipment. Do required maintenance.

(2) Weekly cleaning:

Clean chalk boards following manufacturers directions for cleaning. Heavy use may require more frequent cleaning.

(3) Every two weeks cleaning:

Clean doors, door knobs, and hand rails with soap solution.

(4) Monthly cleaning:

(a) Clean lighting fixtures. Some types may require less frequent cleaning.

(b) Wash windows. A month's accumulation of dirt may reduce light 25%.

(5) Semi-annual cleaning: (Christmas and summer vacation)

(a) The building should be thoroughly cleaned. This means to brush or wash all walls, ceilings, and window shades or blinds, wash all woodwork, windows, fixtures, glass partitions, seating units and furniture. Scrub or wet mop all school room and corridor floors.

(b) Check all light fixtures and replace the lamps and shades after cleaning them.

(6) Annual summer maintenance:

(a) Major repairs should be planned in advance to permit completion during the summer vacation.

(b) Painting should be done at this time. Painting a few rooms or corridors each year distributes the cost of painting the building over a longer period of time.

(c) All mechanical equipment should be checked including all heating and ventilating equipment. Follow the manufacturers recommendations for routine maintenance. All equip-

ment found faulty should be overhauled or replaced. Steam heating systems must be checked in accordance with requirements of the Montana State Industrial Accident Board.

(d) Building should be thoroughly cleaned as in (5-a) above shortly before school opens. If the school is thoroughly cleaned at the end of the school year, it probably will again require cleaning at the start of the fall term.

Part II

Montana State Law

Chapter 31, R. C. M. 1947 Annotated—School House Sites and Construction.

75-3101. SELECTION. Whenever, in the judgment of the board of trustees of any school district of the third class, it is desirable to select, purchase, exchange, or sell a school house site, or whenever petitioned so to do by one-third of the voters of such district, the district board shall without delay call a meeting at some convenient time and place fixed by the board to vote upon such question of selection, purchase, exchange, or sale of school house site. Such election shall be conducted and votes canvassed in the same manner as the annual election of school officers. Three notices giving the time, place, and purpose of such meeting shall be posted in three public places in the district by the clerk at least ten days prior to such meeting. If a majority of the electors of the district voting at such meeting or election shall be in favor of selecting, purchasing, exchanging, or selling the school house site, the board shall carry out the will of the voters thus expressed; provided, that all sites so chosen must be approved by the county superintendent of schools and the county health officer; and also provided that any sites so changed cannot again be changed within three years from the date of such action, except upon the advice of the county superintendent of schools and county health officer.

The school site shall be selected in a place that is convenient, accessible, suitable, and well drained; provided, that in districts of the first and second class, the site shall be not less than one-half of an average city block, and in districts of the third class shall contain not less than one acre. The State Board of Land Commissioners shall have authority to sell to any school district at the appraised value, or to lease for any period of time less than ninety-nine years, at a rental of one dollar per year, any tract of state land not exceeding ten acres, to be used for school house site.

75-3102. ARCHITECTURE—APPROVAL OF STATE BOARD OF HEALTH REQUIRED. No school building in the State, either publicly or privately owned or operated, shall hereafter be erected, repaired, or enlarged until the plans and specifications thereof shall have been submitted to the State Board of Health, and its approval endorsed thereon. Such plans and specifications shall show in detail the ventilation, the heating, and lighting of such building.

75-3103. FLOOR SPACE-AIR-LIGHT-REGULATIONS BY BOARD OF HEALTH. The State Board of Health shall not approve plans for the erection of any school building, or addition thereto or remodeling thereof unless the same shall provide (a) at least fifteen (15) square feet of floor space and two hundred (200) cubic feet of air space for each pupil to be accommodated in each study or recitation room therein; (b) a system of ventilation which shall in the judgment of said State Board of Health be

adequate to produce satisfactory conditions of air in all school rooms at all times and under all conditions; (c) a ventilation system of fire resistant material and construction, and (d) a system of heating that shall be considered by the State Board of Health as fully adequate and (e) a system for lighting all parts of the building that shall produce at all times illumination of such quality and quantity as shall be satisfactory to the State Board of Health.

The State Board of Health shall, from time to time, as deemed necessary, adopt regulations in the manner provided by law, setting forth the requirements for school sites, school buildings, ventilation, heating, lighting, water supply, sewage and waste disposal, and such other matters as pertain to the health and physical well-being of the students, teachers and others who frequent schools.

Any contractor, architect, school board or any other person, firm or corporation who shall violate the provisions of this Act, or of any regulation promulgated under this Act shall be deemed guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than one hundred dollars ($100), nor more than five hundred dollars ($500).

75-3104. PENALTIES. The county treasurer shall not make any payments on any contract arising under the provisions of this chapter until the contractor furnishes a certified statement, signed by the State Board of Health, that the plans and specifications of the school building to be erected or remodeled have been fully approved by the State Board of Health.

75-3105. SUGGESTIVE PLANS. It shall be the duty of the State Board of Health to furnish to all districts of the third class suggestive plans for school buildings, to be erected in conformity with the above rules.

75-3106. VESTIBULES. No one and two-room school houses shall be erected without a vestibule of reasonable size.

75-3107. CARE OF SCHOOL HOUSES. It shall be the duty of boards of trustees in districts of the third class to require that the school room or rooms shall be thoroughly scrubbed and cleaned, including the floors, interior woodwork and windows, at least once every three months.

75-3108. WATER SUPPLY AND TOILET ACCOMMODATIONS. The board of trustees shall furnish such water supply and toilet accommodations as shall be approved by the State Board of Health.

Part III

Regulation No. 91

GENERAL REQUIREMENTS

All school buildings hereafter erected, repaired or enlarged must conform to the requirements contained in this section and Sections I to VII inclusive.

a. Plans and specifications shall be submitted to the State Board of Health for review and approval and shall include layout of the plot site, including size of area, additional structures and natural features, general plan, grading plan, and details covering ventilation, lighting, heating and sanitary facilities. Criteria covering these particular features are included in Section I through Section VII of these regulations.

b. Accompanying the plans and specifications, and in addition to them, there shall be submitted to the State Board of Health by the architect and/or engineer, either in writing or in person, a brief but clear and concise statement setting forth the details of lighting, heating, (including means of delivering heat to room), ventilation (including means of admitting fresh air and ventilating foul air), water supply as set forth below, and use to which the rooms are to be put.

Section I

SITE AND GROUNDS

1. **Inspection.**

   All school building sites shall be inspected by the local health officer having jurisdiction, when requested by the State Board of Health, and a report of the inspection shall be furnished as part of the plans.

2. **Area—Minimum Requirements.**

   a. The area shall be sufficient to provide adequate space for all school facilities and activities. The total land for an elementary school should be five (5) acres to serve up to 300 pupils, plus one (1) acre for each 100 additional pupils; except that one, two and three room elementary schools should have a minimum of two (2) acres. Junior high schools up to 300 pupils, ten (10) acres, plus one acre for each 100 additional pupils. Senior high schools and combination elementary and high schools up to 300 pupils, ten (10) acres excluding football stadiums; 700 or more pupils, fifteen (15) acres plus one and one-half (1½) acres per 100 additional pupils over 700 excluding football stadiums.

3. **Drainage and Maintenance of Grounds.**

   a. The topography of the site shall be such that slopes are moderate

for suitable play area, but sufficient to permit good drainage of surface water.

b. The school grounds shall be such as to provide a dry play area.

c. The school grounds shall be graded and suitable surface provided for the planned activities.

d. All parts of the school grounds shall be inspected regularly. Obstructions and materials which may prove dangerous shall be removed. The grounds shall be kept free of refuse.

e. All schools shall be provided with suitable walks to serve foot traffic from the property line to the school entrances.

4. **Playground Equipment.**

a. Playground equipment, if provided, shall be located to permit adequate supervision and maximum use. Playground sites shall be located so as to avoid having children cross streets, driveways or parking areas.

b. Each piece of apparatus shall be so located that children playing on it will not endanger children playing on other pieces of equipment.

c. Playground equipment shall be so located to permit ample area on the school grounds for other play.

Section II

SCHOOL BUILDINGS

1. **Building Codes.**

a. In all construction of new schools, and in all additions of existing structures the latest addition of the following codes or higher local codes shall be complied with except as herein modified. Any remodeling shall meet the requirements of these regulations as to safety and health and shall not lower the standards of existing structures:

(1) Either "Uniform Building Code" as published by the Pacific Coast Building Officials Conference or the "National Building Code" recommended by the National Board of Fire Underwriters latest editions.

(2) "Montana State Plumbing Code".

(3) "The National Electrical Code" of the National Board of Fire Underwriters latest edition.

2. **Entrances and Exits.**

a. There shall be provided an entrance vestibule, of such size as will permit opening of the door with at least one person in the vestibule, for all one and two room schools. The minimum size of the vestibule shall be not less than four (4) feet long by five (5) feet wide.

b. Each exit door shall open outward and shall not be provided with a latch or lock unless it is panic hardware as required by the State Fire Marshal and/or applicable code.

c. Exit from school facilities shall meet all requirements of the Montana State Fire Marshal.

3. **Classrooms.**

   a. There shall be a minimum of 15 square feet of floor area (20 square feet are recommended) and 200 cubic feet volume available for each student in a classroom. Classrooms shall have a minimum average ceiling height of nine feet and no portion of the ceiling shall be less than eight feet six inches above the floor.

   b. Interior finish of all classrooms shall be such as to provide sufficient reflections of light without glare. (See Section III concerning lighting.)

   c. The finished floor in classrooms shall not be greater than 24 inches below grade line.

   d. There shall be adequate wrap and book storage for each pupil.

4. **School Lunch.**

   Facilities for school lunch programs shall be constructed in accordance with the Montana State Board of Health Regulations.

5. **Living Quarters.**

   a. Plans and specifications shall show the relation between living quarters for the teacher or other employees and the school.

   b. Teacherage or other living quarters shall be isolated from the school proper and shall not be used as a clasrsoom or a room devoted to school purposes.

Section III

LIGHTING

1. All spaces shall be so constructed and equipped to provide the levels of illumination required in this section.

   a. This illumination may be provided by daylight and/or artificial lighting.

   b. Windows shall be so arranged that pupils do not face sources of light.

   c. Each classroom shall be provided with window space along an outside wall, which window space shall be so located that a seated student of average height can see along a horizontal sight line a minimum distance of 40 feet from the outside of a classroom wall. This window shall be no less than 16 inches high and the total width of clear glass shall be no less than two-thirds of the wall length in which the window is located.

   d. All windows and skylights shall be provided with light diffusion means, or shall be of such type and design to limit excessive brightness.

   e. Rooms not requiring natural light are such rooms as science laboratories, shops, domestic science rooms, commercial science rooms, music, audio-visual, toilets, offices—including teachers' work rooms and nurses' rooms, locker room and shower rooms, multipurpose rooms, gymnasiums, auditoriums and stages, storage rooms, boiler

rooms and mechanical equipment rooms, corridors, kitchens and cafeterias.

f. All rooms in all schools shall be provided with artificial illumination and/or natural lighting which shall provide light as per No. 2 below.

2. Minimum standards of light—artificial and natural:

a. Quantity

(1) The amount of maintained light measured in footcandles shall not be less than tabulated herewith:

Storerooms	5
Corridors, laundry rooms, locker rooms, shower rooms, stairways and auditoriums (not for study)	10
Cafeterias, reception rooms, swimming rooms, gymnasiums (for general exercise)	20
Classrooms, on desks and at chalkboards, study halls, lecture rooms, art rooms, libraries, toilet rooms and shops	30
Laboratories, drafting rooms, typing rooms, classrooms for pupils with defective vision and those requiring lip reading	50

b. Quality

(1) Lighting shall be coordinated with color schemes and surfaces to produce satisfactory brightness ratios. Luminaires shall be used which do not produce excessive brightness.
Classroom standards shall be as follows:

(a) Reflective values.

Ceilings	80-85%
Window walls	75-80%
Other walls	50-60%
Trim	30-60%
Desk and equipment	35-50%
Floor	20-50%
Chalkboards	15-20%

(b) Brightness ratios.

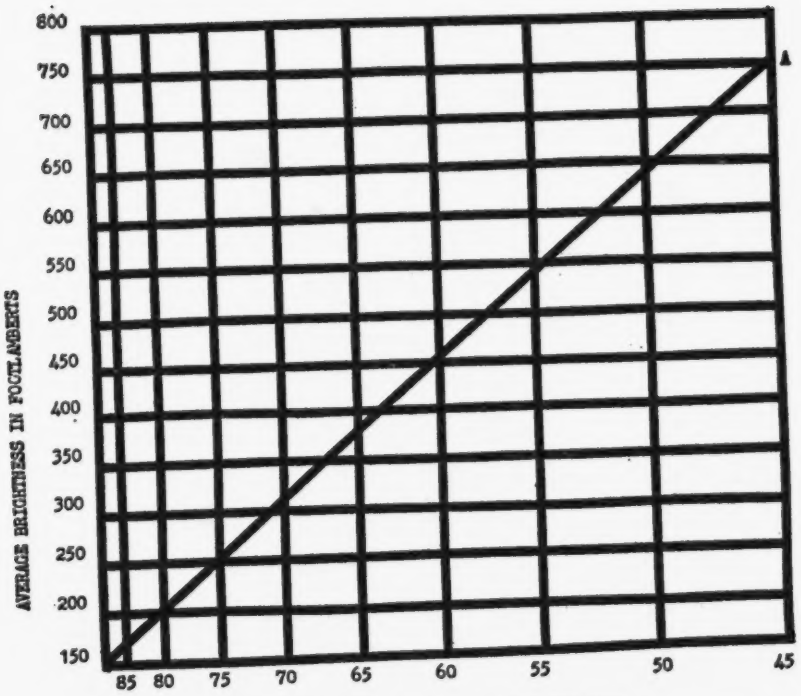
Between the seeing task and immediately adjacent surfaces, such as between task and desk tops	1 to ⅓
Between the task and the more remote darker surfaces, such as between task and floor	1 to 1/10
Between the task and the more remote lighter surfaces, such as between task and ceiling	1 to 10
Between luminaires or windows and surfaces adjacent to them in the visual fields	20 to 1
Anywhere within the normal field of view	40 to 1

(c) Luminaire Brightness.

Average brightness of a luminaire shall fall between the two lines on the graph below. The maximum brightness of a luminaire shall not exceed the average by more than 5 to 1.

(NOTE: See Figure 1.)

SCISSORS CURVE



Note: 1. Average brightness acceptable when plot falls entirely below line A.

MAXIMUM BRIGHTNESS IN FOOTLAMBERTS

	70	65	60	55	50	45
Parallel						
Ratio						
Transverse						
Ratio						

2. Ratio of maximum to average brightness must not exceed 5 to 1.

Section IV

HEATING AND VENTILATING

1. **Heating.**

   a. Space heating systems shall be designed to obtain the following space ambient temperatures:

      (1) Classrooms, offices, music rooms, auditoriums, multipurpose rooms, libraries, cafeterias, toilets, and similar rooms—70° F. at 4′ -0″ from floor.

      (2) Locker rooms and showers—80° F. at 4′ -0″ from floor.

      (3) Gymnasiums—65° F. at 4′ -0″ from floor.

      (4) Temperature spread from floor to 6′ -0″ above floor not to exceed 5° F.

   b. The outside design temperature and wind velocity shall be as recommended by the American Society of Heating, Refrigerating and Air-conditioning Engineers.

   c. Methods of Heating.

      (1) Any system of supplying heat that is recognized by the ASHR&AE shall be acceptable provided the following standards are met:

      (a) Heat emitting units and/or surfaces exposed and available to contact by occupants of the space shall not produce any deleterious effects when touched, except that exposed cast iron radiators may be used where steam pressure does not exceed 2 psi or water temperature does not exceed 218.5° F.

      (b) Heat shall be supplied in such a way as to produce even temperatures within the space without excessive operational noise levels or drafts.

      1. Equipment noise levels shall not exceed these values:

         Classrooms, libraries, offices ..... 45 decibels

         Music rooms, auditoriums, multipurpose rooms ..... 40 decibels

         Gymnasiums, locker rooms, shower rooms ..... 50 decibels

         Others ..... 45 decibels

      2. Excessive draft shall be defined as air striking the occupants of the space at a higher velocity than 50 fpm when the occupants are in their normal positions.

   d. All equipment shall meet and be installed in accordance with the following: (Where there is conflict the higher requirement shall govern.)

      (1) Montana State Fire Marshal.

      (2) Montana State Industrial Accident Board.

      (3) Underwriter's Laboratories.

      (4) Uniform Building Code, Pacific Coast Addition, latest edition.

e. **Fuels.**

(1) **Any fuel which the owner deems advantageous may be used providing its storage and handling, and the equipment using it, meets the requirements of the following: (Where there is conflict the higher requirement shall govern.)**

(a) **Montana State Fire Marshal.**

(b) **Montana State Industrial Accident Board.**

(c) **Underwriter's Laboratories.**

(d) **Uniform Building Code, Pacific Coast Addition, latest edition.**

f. **Heating and ventilating equipment having an open flame shall not be located in rooms occupied by pupils.**

2. **Ventilation.**

a. **Each space normally occupied by school personnel shall be provided with adequate ventilation, either mechanical or natural (except where required to be mechanical as noted below) as follows:**

(1) **Classrooms (except as noted below), libraries, and similar spaces:**

(a) **Mechanical.**

1. **Recirculating.**

a. **Sufficient air shall be circulated to provide 30 cfm per person or 6 room air changes per hour (whichever is greater), with the introduction of at least 10% outside filtered air during the period of occupancy.**

2. **Non-recirculating.**

a. **Sufficient outside filtered air shall be introduced to provide 7½ cfm per student grades 1-8 and 10 cfm per student grades 9-12 during the period of occupancy.**

3. **Provisions shall be made for exhausting the excess air.**

(b) **Natural.**

1. **Air shall be introduced into the room through windows or ventilators (of such type and so installed as to prevent the air from striking the occupants in their normal positions) in sufficient amount to provide 5 cfm per student grades 1-8 and 7½ cfm per student grades 9-12 during the period of occupancy. Gravity exhausts shall be used to provide this ventilation of such type and so installed as to provide this air with a 5 mph wind from any direction.**

(2) **Home Economics Rooms (where cooking is done), Biology and Chemistry Classrooms, Dining Rooms:**

(a) **Mechanical.**

1. **Recirculating.**

a. **Sufficient air shall be circulated to provide 30 cfm per person or 6 room air changes per hour (whichever is**

greater), with the introduction of at least 20% outside filtered air during the period of occupancy.

2. Non-recirculating.
   a. Sufficient outside filtered air shall be introduced to provide 7½ cfm per student grades 1-8 and 10 cfm per student grades 9-12 during the period of occupancy.
3. Provisions shall be made for exhausting the excess air directly to the outside.

(3) Gymnasiums, auditoriums, multipurpose rooms.

(a) Shall be provided with mechanical ventilating systems.

(b) Sufficient air shall be circulated to provide 30 cfm per person with the introduction of at least 10% outside filtered air during the period of occupancy.

(c) Provsions shall be made for exhausting the excess air.

(4) Locker rooms, shower rooms, toilets, kitchens.

(a) Shall be provided with mechanical exhaust.

(b) Sufficient air shall be exhausted to provide a minimum of 10 room air changes per hour during the period of occupancy.

(c) Air shall be exhausted directly to the outside and in such a location that it shall not re-enter the building under normal conditions.

(d) Means shall be provided to re-supply the air which is exhausted.

Section V

WATER SUPPLY

1. **Source.**

Water supplies shall be from a source approved by the State Board of Health. The source, whether public or private, shall be shown on the plans submitted. The water service line and the sewer lines shall not be buried in the same trench but in separate trenches 10 or more feet apart. Where water and sewer lines cross, the sewer line shall be of pressure pipe for a distance of 10 feet on either side of the water line. Any wells, springs or cisterns in use shall be located, constructed and maintained in an approved sanitary manner, approved by the State Board of Health. The well casing shall terminate at least 12 inches above the ground level. The well pumping equipment shall be placed above the well casing except for submersible type pumps. The Board of Health may require, when the school water supply is not from an approved public water supply, periodic inspections and examinations of the water to determine its quality in the same manner as the Board does for public water supplies. For these services a fee will be charged as provided for in public supplies.

2. **Drinking Water.**

   a. The use of common cups is prohibited.

   b. Drinking fountains required by plans and specifications shall be described by name and address of manufacturer and by catalog number. All drinking fountains shall be so designed that the mouth cannot touch the water outlet and that water, after touching the lips of the user, cannot fall back on the orifice or become mixed with drinking water. The slant-jet type of drinking fountain ordinarily meets this requirement. Combination drinking fountain-faucets at sinks are not satisfactory and do not meet the fountain requirement. This does not prohibit separate fountains at sinks. The waste water pipe of the fountain shall be separate and distinct from the water supply pipe. Cross-connections and back-siphons must be prevented. There shall be at least a minimum of one drinking fountain for each 75 pupils, preferably one fountain for each 50 pupils. There shall not be less than one drinking fountain on each floor for a school building. Fountains shall not be located in toilet rooms. Each fountain shall be equipped with a proper valve to regulate its pressure and an adjustable spring type self-closing control valve. Suggested fountain heights are as follows:

Kindergarten to Grade 3	26 to 28 inches
Grades 4 to 6	30 to 36 inches
Grades 7 to 12	36 to 40 inches

   c. Where water under pressure cannot be made available, the drinking water from an approved supply shall be stored in a clean covered container having a close fitting lid and a spring type or other suitable faucet for the filling of individual cups. Individual single service drinking cups shall be provided in ample quantities with a sanitary type of dispenser. All buckets or vessels used to fill the water container shall be clearly labeled indicating their purpose and shall be used for that purpose only. When the vessels are not in use, they shall be stored in a dust-free clean closet.

Section VI

TOILETS, PLUMBING AND WASTE DISPOSAL

1. The means for disposing of sewage shall be completely described in the plans.
2. Where a public sewer system is available, all toilets or water closets, sinks, wash basins, and other plumbing fixtures shall be connected to that sewer.
3. All school plumbing shall be designed and installed to meet the minimum requirements of the Montana State Plumbing Code. Local city plumbing code requirements higher than the Montana State Plumbing Code must be met where applicable.

4. **Location.**

a. Toilet facilities shall be so located with respect to the flow of traffic to be conveniently accessible to other facilities, such as classrooms, libraries, study halls, and lunchrooms. Gymnasiums shall have toilet, shower, and drinking fountain facilities in sufficient number based upon the maximum class anticipated. Multipurpose rooms (Grades 1 to 6) shall have a drinking fountain, and toilet facilities should be nearby. Toilet facilities shall be provided for each sex on each floor of the building in relation to the pupil capacity of that floor. In high schools, the number of toilets on an upper floor may be one-half that required for the number of students, providing consideration is given additional facilities such as library, lockers, and lunchrooms. The total number of toilet units in the building shall not be less than that tabulated below. Toilets for the school nurse and patients, and toilets for the teachers' room shall be in addition to the fixtures listed below.

The following ratio of total number of student toilet fixtures to number of pupils of each sex is set forth as minimum:

	Ratio
Girls Toilet Units	
Elementary	1 to 20
Secondary	1 to 20
Boys Toilet Units	1 to 40
Boys Urinals	1 to 30
Lavatory Facilities	
Girls	1 to 60
Boys	1 to 60

Wash fountains may be used to replace lavatories. When wash fountains are used to replace lavatories, the capacity shall equal the lavatories replaced. Toilet rooms should be of sufficient size to accommodate the required fixtures and the anticipated traffic. A sanitary napkin dispenser and disposal shall be provided for girls above fifth grade, and in teachers' toilet rooms and nurses' toilet rooms.

5. The walls, floors and partitions of toilet rooms shall have smooth easily cleanable surfaces, painted or otherwise protected to make them nonabsorbent and water repellent.

6. Toilet fixtures and lavatories shall be of the proper type and installed at the proper height to accommodate the size of children for which the fixture is intended to serve. There shall be separate toilet rooms provided for boys and girls in grades 4 through 12 inclusive. Toilets for kindergarten and grades 1 through 3 inclusive, may be as follows:

a. Gang toilets—one for boys and one for girls. The same gang toilets which serve grades 4 and up may be used, providing the provisions of this regulation are met.

b. Individual room toilets serving both boys and girls and located immediately adjacent to the classrooms being served.

c. Dual toilets for boys and girls serving two rooms wherein there is one boys toilet serving two rooms and one girls toilet serving the

same two rooms. The toilet rooms shall be immediately adjacent to the rooms being served.

Grades 4 through 12 shall have centrally located toilet rooms with gang plumbing installations. In no instance if more than one classroom is served by a toilet room shall there be less than two fixtures of each type provided. Separate toilet rooms serving one classroom shall not require a urinal.

7. Adequate handwashing facilities consisting of soap, towels and water, preferably warm water, shall be available to all pupils. Individual-use towels in a suitable dispenser shall be provided.

8. **Privies.**

   a. Where water-carried sewage systems are not provided, sanitary pit privies or chemical toilets shall be provided.

   b. Sanitary pit privy sites shall be located at least 50 feet from any well or cistern. The privy must be so located that surface drainage or seepage will not reach a well or cistern. In special cases, it may be necessary to locate the privy further from the source of water supply. Plans and specifications shall include information as to the depth of ground water, character of soil, surface slope of the ground and location of the water supply in reference to the privy and other buildings.

   c. Separate privies shall be provided for each sex. The privies shall be equipped with one riser for each 20 pupils of each sex. "Where there is no fence dividing the play yards of the sexes, the privies . . . shall be separate and distinct buildings, and situated at least 20 feet apart . . . " (From R.C.M. 1947, 75-1632.)

      Privies shall be constructed in accordance with State Board of Health Circular No. 13 and shall be maintained in a manner so that flies, insects, and rodents do not have access to the contents therein. Hinged lids shall be provided on all seats. Screened vents shall be provided. Privies shall be maintained in a clean and sanitary manner including provision of an adequate supply of standard grade of toilet tissue.

9. **Sewage and Waste Disposal.**

   a. Sewage.

      (1) Sewage, except from privies, shall be disposed through a public sewer system if available; if not, through an approved private system such as a properly designed septic tank or Imhoff tank.

      (2) Septic tanks shall not be located within 50 feet of any water supply. In some cases, greater distances may be necessary (see No. 8 above concerning location of privies.)

   b. Other Wastes.

      (1) Plans and specifications shall describe the method of disposal of garbage, trash and refuse. Where a public facility is not available, specific descriptions of the facilities to be provided for the school shall be included with the construction plans.

Section VII

EQUIPMENT

1. **First Aid.**

   All school buildings shall be provided with at least one readily accessible and properly equipped first-aid cabinet, preferably located in an area with running water facilities, a cot and blankets.

2. **Fire Prevention.**

   All school buildings shall provide on each floor one or more fire extinguishers as required by the State Fire Marshal.

Adopted by the State Board of Health
on March 19, 1948.
Revised on May 18, 1952.
Revised on March 28, 1957.
Revised on February 23, 1963.